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USSR Report

ENERGY

No. 3

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ELECTRIC POWER

MINISTRIES COOPERATE IN GEOTHERMAL ENERGY RESEARCH

Moscow IZVESTIYA in Russian 27 Jan 80 p 1

[USSR Ministry of Power and Electrification response to IZVESTIYA article on geothermal energy]

[Text] The USSR Minenergo [Ministry of Power and Electrification] has examined the article "Heat of the Earth" ("IZVESTIYA" No 210, 1979).

Utilization of the heat of the earth in the national economy is a complex problem which requires the participation of a number of ministries: Ministry of Geology, Ministry of the Gas Industry, Ministry of the Petroleum Industry, Ministry of the Chemical Industry, Ministry of Power Machine Building, Ministry of Agriculture, and republican ministries of public utilities.

In order to develop first-priority measures for the utilization of renewable sources of energy in the national economy, the USSR Gosplan resolved to assign appropriate tasks to the above-mentioned ministries.

The USSR Minenergo is charged with developing in 1980, jointly with the USSR Ministry of Geology, Ministry of the Gas Industry, Ministry of the Petroleum Industry, and the USSR Academy of Sciences, a draft of the valuation of existing wells and the preparation of proposals for their utilization, as well as a technical and economic report on the use of thermal water for heat supply to residential and industrial buildings.

In 1980, the USSR Minenergo, in cooperation with the USSR Academy of Sciences will prepare a report on technical and economic justification of the construction of large geothermal electric power stations in the Dagestan ASSR and in Kamchatskaya Oblast.

The USSR Ministry of Agriculture is charged with developing, in cooperation with the USSR Minenergo and the USSR Ministry of Geology, a technical and economic report on the use of thermal water for heat supply to hothouses and buildings of animal breeding complexes and other agricultural buildings.

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NEW EQUIPMENT TO BE INTRODUCED AT POWER, HEAT SUPPLY NETWORKS

Tallin SOVETSKAYA ESTONIYA in Russian 9 Jan 80 p 2

[Article by T. Andreyeva]

[Text] The USSR Ministry of Power and Electrification has approved a list of the most important projects for the introduction of new equipment carried out by enterprises of electric power and heat supply networks, electric power stations, scientific research and design institutes, and other power engineering organizations of the country.

The list of the most important projects include nine which are being carried out by power engineers of the Estonian SSR in creative cooperation with specialists of Moscow, Leningrad, Riga, and L'vov.

According to preliminary calculations, an annual saving of 200,000 rubles will be achieved by the introduction of automatic devices for breakdown prevention which will improve the stability of the Estonia-Latvia intersystem connections with an automatic device for metering the unloading and with power control at the Leningrad-Moscow electric power transmission lines. This measure will noticeably improve the reliability of the integrated power system of the Northwest and make it more economical.

The startup and adjustment at the Estonskaya GRES of two pilot experimental industrial units for thermal processing of combustible shale with a capacity of 3,000 tons of raw shale a day with burning the processing products in redesigned "TP-101"-type boiler units makes it possible to increase the electric power of the turbogenerator by 5,000 kilowatts. At the same time, rules were developed for burning processing products, semicoke gas and shale oil, because this innovation will soon be used for 16 boilers of the electric power stations.

In order to protect the environment and make the equipment at the Pribaltiyskaya GRES more economical, a group variable-speed drive is being introduced for the electrode shaking mechanisms of electric filters which will increase considerably the efficiency of the ash-catching process. A new technology of thermal conservation of boilers at a daily minimum load of the electric power station is being introduced at the same GRES. This will yield a saving of about 40,000 rubles a year.

At the Kokhtla-Yarveskaya TETs, the introduction of a new furnace design for a two-stage burning of Estonian shale and the use of a contact-type high-temperature heat exchanger for preheating oxygen-enriched blasting will save about 60,000 rubles annually.

The workers of "Estonglavenergo" [Estonian Main Power Supply Administration] are introducing an automated system for processing information on the reliability of power equipment and electric power transmission lines.

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PLANS FOR ENERGY INDUSTRY IN KIRGIZ SSR REPORTED

Frunze SOVETSKAYA KIRGIZIYA in Russian 12 Feb 80 p 3

[Article by M. Azrilyan, Head of Kirgiz Main Power Supply Administration]

[Text] Toktogul'skaya GES, the leader in hydraulic power engineering of the Kirgiz SSR, has produced five billion kilowatt-hours of electric power above the schedule since the moment it was started. This made it possible to save almost two million tons of mazut at thermal electric power stations of the integrated power system of Central Asia.

Toktogul'skaya GES produces 8-10 million kilowatt-hours of electric energy daily, covers the peak loads of the autumn-winter maximum of the needs of Kirgiziya, and helps in this respect its sister republics, Uzbekistan and Kazakhstan. The Uzbek power system and the Frunze and Alma-Ata power regions receive its inexpensive electric power via two high-capacity electric power transmission lines of 500 kilovolts: Toktogul -- Andizhan and Toktogul -- Frunze.

The first place in our national economic plans is always given to electric power engineering. And this is understandable. The production of electric energy is one of the main indexes of the economic potential of the country and of the material and cultural level of the people.

The example of the Kirgiz SSR shows clearly the outstanding achievements made by the country in the area of the construction of power facilities and production of electric power.

During the four years of the Tenth Five-Year Plan alone, 246.3 million rubles were invested in the development of this industry, and 191.4 million rubles of fixed capital were put into operation. During this period, a 100,000 kilowatt turbine unit No 10 was built and delivered for operation at Frunzenskaya TETs, and 1,215 kilometers of electric power transmission lines were built, including the largest LEP [electric power transmission line] of 500 kilovolts connecting the Toktogul'skaya GES with the city of Frunze.

The operation of the Toktogul'skaya GES at its rated capacity and the introduction of new capacities at the Frunzenskaya TETs made it possible to ensure stable electric power supply to meet the growing needs of the national economy of the republic and reach the level of electric power production envisaged by the control figures of the Tenth Five-Year Plan.

Today, the power industry of the Kirgiz SSR is a highly developed independent industry engaging 9,000 people. In 1979, electric power stations of the republic produced 7.5 billion kilowatt-hours of electric power, 83% more than in 1975.

The efficiency of power production and the quality of work improved considerably. Since the beginning of the five-year plan, 35 million kilowatt-hours of electric power and 18,000 tons of conventional fuel have been saved and labor productivity increased by 75.1%. Above-plan profit amounted to 6.4 million rubles.

In compliance with the agrarian policy of the party, special attention is being given to the electrification of agriculture. During the four years of the plan alone, 35 million rubles were spent for this purpose. Many substations and 5,757 kilometers of rural electric power transmission lines were built and put into operation. Electric power was provided for 1,632 sheepyards, 54 large animal breeding complexes, 134 farms, over 400 wells and many other agricultural facilities. As a result of this, the power-worker ratio in rural areas increased by a factor of 1.6 in comparison with 1975.

The achievements of the four years of the five-year plan provided a solid foundation for successful solution of the large-scale problems of 1980. It will be necessary to produce 8.7 billion kilowatt-hours of electric power, four billion gigacalories of thermal energy, to introduce 66 million rubles of capital investments and 41 million rubles of fixed capital. This means that the first units of the Kurpsayskaya GES and 547 kilometers of new electric power transmission lines will start operating. The most powerful electric transmission line is the Frunze -- Bystrovka line of 220 kilovolts. It will transmit the power of the Toktogul'skaya GES to the Issyk-Kul' Valley and Narynskaya Oblast. Electrification of agriculture will continue. It is planned to build 1470 kilometers of rural communal electric power transmission lines and to electrify more than 800 sheepyards and many other facilities.

The power industry of the republic is an integral part of the fuel and energy complex of the country. It will continue to develop rapidly due to intensive development of the hydraulic power resources of the mountainous region. This scale of development makes it necessary for the power industry workers to be zealous and to strive constantly for the conservation of fuel and energy resources. We have calculated that by lowering specific fuel consumption in our republic by only one gram for the production of one kilowatt-hour of electric energy, it is possible to save 4,000 tons of conventional fuel a year for the national economy, and by lowering the specific consumption of electric energy by one percent in the area of production, it is possible to save 25 million kilowatt-hours of electric energy or about 10,000 tons of conventional fuel.

In this connection, the workers of heat and electric power stations have started since the first days of January a large-scale drive for the fulfillment of the goal for lowering specific consumption in 1980 by 1.5 grams, and the workers of the State Inspection for Industrial Power Engineering and for Power Engineering Supervision intensified their supervision of rational use of each kilowatt-hour of electric energy in industry.

Responding to the appeal of the party to mark appropriately the 110th Anniversary of V. I. Lenin's Birthday and the 26th CPSU Congress, the workers of Kirgizglavenergo [Kirgiz Main Power Supply Administration] started a movement for making the final year of the five-year plan a year of accelerated work, work in the Lenin fashion.

All 15 industrial enterprises and six construction organizations of the power system are participating in the all-union socialist competition and 397 leading workers of the industry promised to fulfill their personal tasks and socialist pledges of 1980 ahead of schedule. The pace is set by the best workers: Yu. Potantsev, shift foreman of the boiler department of Frunze TETs; N Shamkin, excavator operator of the Frunze enterprise of electric power network; T. Niyazov, electrician of the Bystrovka PES [peak-load electric power plant]; D. Dzhakeyev, electrician of the Naryn PES; I. Sartbayev, foreman of the Osh PES; and S. Myrzabayev, electrician of the power sales office.

The year of 1980 is significant also because it will be 60 years in December since the acceptance of Lenin's GOELRO [State Commission for the Electrification of Russia] plan. The power industry workers and builders of power facilities of the republic are striving to mark this occasion by an early fulfillment of the goals of the Tenth Five-Year Plan.

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ELECTRIC POWER

PROGRESS IN RURAL ELECTRIFICATION REPORTED

Dushanbe KOMMUNIST TADZHIKISTANA in Russian 1 Feb 80 p 1

[Article from "PRAVDA", 30 January]

[Text] The older Soviet generation remembers the words of a popular song: "In the village electric poles started marching hurriedly from house to house..." Today, "The hurriedly marching poles" do not surprise anybody. They became part of the rural scenery to which everyone is accustomed. V. I. Lenin's dream to electrify the entire Russia, in industry and agriculture, became a reality. The country is covered by a dense network of electric power transmission lines. In rural areas alone, their total length exceeds 3.5 million kilometers, and the annual consumption of electric energy reached 100 billion kilowatt-hours.

Powerful facilities came to the aid of farmers and animal breeders. More than 12 million electric motors have been installed in kolkhozes and sovkhozes. The power-worker ratio in agriculture is almost six times greater than in 1965. The consumption of electric energy for munisipal and domestic needs per one rural resident has increased by a factor of 3.5. All this made it possible to raise labor productivity substantially and to improve living conditions in rural areas.

At the 25th Party Congress and the July (1978) Plenum of the CPSU Central Committee, measures were determined for further development of rural electrification. During the Tenth Five-Year Plan, consumption of electric energy in rural areas must approximately double. Much has already been done in this direction, but not everything that was planned. The reason for this is, primarily, in the fact that the construction and installation organizations of the Ministry of Power and Electrification of the USSR cannot cope with the work plan. In four years, they did not complete about 200 million rubles worth of jobs and failed to put into operation over 50,000 kilometers of electric power transmission lines and large number of transformer substations. For example, their construction is progressing extremely slowly in the Tadzhik SSR, Belgorodskaya, Kemerovskaya, L'vovskaya, Vostochno-Kazakhstanskaya, and some other oblasts of the Nonchernozem Zone of the RSFSR. In order to correct the situation faster, it is necessary to expand mechanized teams and installation administrations by adding more skilled workers and equipment, and see to it that the work is efficiently organized. Much depends also on the State Committee for Material and Technical Supply and the Ministry of the Lumber Industry of the USSR whose job is to provide everything that is necessary for rural electrifiers.

Close attention should be given not only to these problems, but also to everything that has to do with the prospects for the development of power facilities. By the end of the next five-year plan, it is planned to bring the volume of electric power consumption in agriculture to 170-190 billion kilowatt-hours. Specialized subdivisions of the ministries of power and electrification, agriculture, land reclamation and water resources of the USSR must make every effort in order to put into operation about one million kilometers of lines in the next few years, to create more than 1300 repair and operation centers, and to speed up overall mechanization of production processes in plant growing and animal breeding.

It is important to ensure a reliable supply of electric power to kolkhozes and sovkhozes, particularly in winter. Interruptions in its supply upset the technology of production, put equipment out of operation, and result in irreplaceable losses of products. So far, only one-half of 6000 agricultural facilities of the first category has standby electric power supply. Kolkhozes and sovkhozes have thousands of kilometers of electric power transmission lines whose repairs and operation are poorly organized in many rayons. It is the responsibility of the enterprises of the USSR Ministry of Power and Electrification to improve the technical equipment of operational subdivisions and to ensure the stability of electric power supply.

Rural workers have the right to depend on a more effective help of the workers of the electrical engineering industry. The output of appropriate equipment, apparatus, and devices is still insufficient. The USSR Ministry of the Electrical Equipment Industry, Ministry of Power and Electrification, Ministry of Industrial Construction, and Ministry of Construction should accelerate the construction and reconstruction of electromechanical plants, which will make it possible to increase the production of equipment and meet the needs of agriculture better.

Effective utilization of electric power, equipment, and machines depends considerably on the operation of the engineering services of kolkhozes and sovkhozes and associations of Goskomsel'khoztekhnika [State Committee on Agricultural Equipment]. In the meantime, letters received by "Pravda" indicate that many farms have a shortage of engineers, electrical technicians, and skilled electricians. As a result of this, complicated equipment and devices are attended by people who do not have special knowledge. It is the duty of the Ministry of Agriculture, Ministry of Power and Electrification, and agencies of higher and professional education to improve the training and skills of specialists in this area and to improve their working and living conditions, which will make it possible to reduce the labor turnover.

At the present time, many regions of the country have newly created interfarm associations "Sel'khozenergo". They are operating successfully in Belorussia, Tatar SSR, and in Bryanskaya, Moskovskaya, and a number of other oblasts. For example, in the Russian Federation, thousands of feed preparation shops and grain cleaning and drying centers have been prepared for operation with their help and hundreds of pumping units and boiler rooms have been automated. By introducing routine maintenance and technical servicing, the idling of electric motors due to failure has been reduced considerably there. However, the material and technical facilities of these associations are weak. It is important that planning and management agencies should help them in arranging the delivery of equipment, devices and instruments more speedily.

Further electrification of kolkhozes and sovkhozes is a sure way for the growth of the effectiveness of agricultural production and acceleration of technical progress in rural areas. It is the duty of party organizations to control constantly the fulfillment of the plans for the construction of new lines and transformer substations and to give more attention to the training of rural power engineers. It is necessary to spread socialist competitions among them for successful realization of the goals of the five-year plan, and energy conservation, to disseminate advanced experience more actively, and be stricter with those lagging behind. Development of rural electrification will increase labor productivity and will bring the material and cultural living conditions of the city and the rural area closer together.

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CONSTRUCTION PROGRESS OF ROGUNSKAYA GES REPORTED

Moscow GOVORIT I POKAZYVAYET MOSKVA in Russian No 7, 11-17 Feb 80 p 2

[Article by Yu. Mironov; Monday, 11 February, TV Program No 1, 19:00; "Vostok" -- 15:40]

[Text] The construction of a new hydroelectric power station on the Vakhsha River was officially started on 27 September 1976. It was the Rogunskaya GES. Before that day, surveyors had been working there for about 10 years. They had to obtain answers to thousands of questions in order to select the location of the dam. Twelve variants had to be analyzed and weighed until they decided to use the last variant: it was decided to build the electric power station near a small resort spot, Obigarm.

I visited that construction site even before that day when the inauguration of the construction of this station took place. I saw Obigarm as it looked then and I remembered wild beauty of the canyon where the 320 meter dam of the Ragunskaya GES is now rising.

In spite of the fact that surveyors had worked here for 10 years, their activities did not reflect much on the original beauty of the surrounding cliffs. Their entire work was done in the cliffs, where it was possible to obtain answers on the numerous questions facing the designers of such structures. The strength of the rock on which the dam will rest, the locations of the future quarries for obtaining loam, crushed rock, sand, and gravel had to be determined. This dam will be a rock-filled dam, just as the Nurekskaya GES. And now, more than three years have past since that memorable day of the beginning of its construction. What has been done during this time? How much of the planned jobs have been done? These are the main problems which interested me when I came again to this construction site! This is what was planned to do next.

It was planned to use 120 million rubles of capital investments so that the main jobs could be started at the construction site in 1980. The period before that was called the preparatory period.

The changes that have taken place were impressive. Obigarm was unrecognizable: it had modern buildings, and still more were under construction. The right bank of the Vakhsha River, which had nothing on it during our last visit, was filled with bases of construction and installation organizations.

In the mountains, near a small settlement of Maydon, the designers finally selected a spot for the future city of Rogun.

But let's go back to the construction of the main structures.

It is already the fourth year, but only one half of the funds allotted for the preparatory jobs (120 million rubles) were used. Moreover, the builders completed 18 million rubles worth of jobs last year while the plan for construction and installation jobs for this year amounts only to 13 million rubles.

The construction cost of the Rogunskaya GES is more than one billion rubles. It will cost one billion plus the 13 millions which are allotted this year... However, it was planned that the GES would start operating in 1990, i.e., at this construction site we see the same tendency that was condemned by the party: orientation toward "long-term construction", toward "uncompleted jobs", toward freezing of capital investments for many years!

This was not caused by the reduction in the financing of the construction project. The administration of construction was poor. Many other problems were also unsolved. At the present time, 1600 people are engaged at the construction of this GES, while there should be 9,000 people already. Obigarm is not ready to take in such a number of builders. Year after year, only one half of the planned funds are allotted for the construction of the city. It is clear to every administrator that the construction of housing and the development of work at a construction site are interconnected problems. In general, this construction site requires close attention in order to complete the construction of the Rogunskaya GES soon.

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ECONOMIC LEVERS IN PETROLEUM INDUSTRY MODIFIED, IMPROVED

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 12, Dec 79 pp 3-6

[Article by V. I. Grayfer and S. M. Levin, USSR Ministry of the Petroleum Industry: "Improving the Economic Mechanism"]

> [Text] "Our challenge is to raise the level of planning and economic management, bring them into line with the requirements of the current stage, the stage of developed socialism, strive for a significant rise in the efficiency of public production, acceleration of scientific-technical progress and growth in labor productivity, and an improvement in the quality of output and, on this basis, secure a steady rise in the country's economy and the well-being of the Soviet people" (from the decree of the CPSU Central Committee of the USSR Council of Ministers entitled "Improving Planning and Strengthening the Influence of the Economic Mechanism on Raising Production Efficiency and Work Quality")

The decree adopted by the CPSU Central Committee and USSR Council of Ministers entitled "Improving Planning and Strengthening the Influence of the Economic Mechanism on Raising Production Efficiency and Work Quality" is a major advance in carrying out the decisions of the 25th CPSU Congress with respect to improving the economic mechanism. Covering a broad range of problems, the decree establishes concrete steps to improve planning and increases the role of economic accountability and economic levers and stimuli. The paramount thing is strengthening long-range planning, which is necessitated, in connection with the growth in the scale in production and growing complexity of intersectorial specialization, by the increased period covered by national economic planning. It is equally important to establish the procedure for compiling long-range plans that makes them more effective.

The comprehensive program of scientific-technical progress developed for a 20-year period by the Academy of Sciences USSR, the USSR State

Committee on Science and Technology, and USSR Gosstroy is a constituent part of long-range national economic planning. Such a program could vigorously direct advances in science and technology to insure achievement of definite goals in development of the country's economy.

With due regard for the comprehensive program and beginning from socioeconomic challenges, USSR Gosplan, with the ministries, is working out the basic directions of economic and social development of the country for the next 10 years by five-year plans, which are being submitted for popular discussion.

Based on the approved basic directions USSR Gosplan develops and delivers to the ministries control figures for the five-year plan with a breakdown by years. The figures are sent to the associations and serve as the basis for development of draft five-year plans. Special-purpose comprehensive programs will be ratified by the start of the five-year plan as a chief element of the long-range plan, covering the most important scientific-technical, economic, and social problems.

The principal plan is the five-year plan with distribution of assignments by years. The problem of strengthening centralized planned management and broadening the independence of enterprises is being solved by converting this to the main form of planning.

Five-year plans will be made stable in the following manner: working out for each year of the five-year plan balances of materials and equipment for an expanded nomenclature, labor and financial resources and production capacities, and plan assignments in conformity with exact economic and engineering calculations, not from the level "attained" in the base year; ratification of stable economic norms (wages, economic stimulation funds, expenditures of material and financial resources, profit distribution) for years of the five-year plan; existence of material reserve by years of the five-year plan in conformity with established norms and evaluation of plan fulfillment by running total from the beginning of the five-year plan.

The five-year plan will become the basis for yearly planning, which gives the assignments of the five-year plan concrete form and insures their unconditional fulfillment.

In order to further democratize planning and give fuller consideration to the wisdom of the masses, the initial shape of the yearly plan will be developed by the production collectives of associations and enterprises. Broadening socialist competition and mobilizing internal reserves, the labor collectives are adopting counter plans which are coordinated with material resources and are included in the yearly program. In this way counter plans become an organic part of the system of state planning.

Steps to improve planning include broadening of the special-purpose program technique and working out criteria of the intensity of plan assignments. Plans should be better balanced and insure concentration of resources in performance of special-purpose programs and accomplishing final sectorial results.

The social orientation of yearly and five-year plans will also grow substantially. They will envision assignments and measures to improve working conditions, raise employee qualifications, and improve their living conditions and medical care.

At all levels of management ratified plans must be given stability. They should be delivered to associations at strictly regulated times. Performance should not be allowed to drop below the actual level, and plan discipline must be observed at all times.

Improvement in the system of plan indicators, which should raise the quality of planning, is subordinated to the jobs of strengthening centralized planning and developing the initiative of production collectives.

The effectiveness of the economic mechanism depends significantly on the system of planning indicators, which determine the qualitative and quantitative criteria of national economic plans.

A new system of plan indicators is being introduced at all levels of economic management. Enterprise work will be evaluated not by gross product, but by the concrete contribution of the collective to fulfillment of plan assignments in physical terms and in the concrete orders of customers and by growth in net output. This will increase work efficiency and quality and improve the use of fixed capital.

The following are new features in plan indicators.

1. The role of physical indicators in production planning and evaluating enterprise activity is rising. This increases the accountability of enterprises for performance of delivery contracts and the degree of fulfillment of these contract obligations becomes the chief criterion for evaluating the results of their activities.

2. In planning production volumes, labor productivity, and the wages fund a transition is being made to the new indicators of normative net output.

3. The importance of indicators related to labor, social development, and production efficiency is rising. Thus, the indicator of the economic impact of scientific-technical measures is being ratified for the first time.

The size of normative net output is determined by taking material inputs away from the basic price, that is all the elements of price that characterize inputs of past labor will be excluded from this indicator. The use of this indicator to measure labor productivity will make it possible to evaluate the labor-intensiveness of an enterprise's program more correctly. As for the indicator of output sold, it will be used only to evaluate fulfillment of obligations for delivery of output in a contract assortment.

The characteristics of development of the petroleum industry as an extracting sector necessitate the use of certain indicators that reflect the sector's tasks. It is very important in this to insure a system of plan indicators which, while excluding the influence of the natural factor as much as possible, will permit a clear indentification of the labor effort of the collective of petroleum workers to achieve the final goal of the sector.

Thus, the petroleum industry has an opportunity to make broad use of the indicators of production of the basic types of output in physical terms, extraction of petroleum and gas, to measure changes in production, labor productivity, and formation of incentive funds as basic sectorial plan indicators.

To evaluate production in the petroleum industry in cost terms it is advisable to use a calculated indicator of commodity (gross) output in constant prices, which eliminates the effect of variations in the location of petroleum extraction by region with different prices for the output. Use of the indicator of normative net output under the special conditions of the petroleum industry is not advisable, however, because the size of net output in the sector is dropping steadily and its graph diverges sharply from that of petroleum extraction. Because the calculated cost of petroleum extraction contains no price for raw material, the use of the artificial norms of net output in the sector makes no sense economically.

The petroleum industry needs special indicators to plan labor inputs and social development.

Labor inputs are determined by the volume of work to operate the wells which are the basic production units of the sector and for continuous operation in the given regime require a good deal of ongoing maintenance and repair which is practically unrelated to their productivity. For this reason, the normative indicator of labor inputs that most fully reflects measures of scientific-technical progress taken to reduce inputs of live labor is the specific number of industrial production personnel needed to operate one well. This indicator is used to determine the planned need for manpower. Its introduction in the petroleum industry is further justified by the fact that with a natural decrease in well productivity, reducing specific labor inputs in the chief factor that raises labor productivity. In the past this indicator has been successfully used in working out the plan sections on labor and production associations and material stimulation at enterprises.

A progressive standard for wages in the petroleum industry must also be developed on the basis of specific labor inputs per well. To use labor resources more efficiently the indicators for labor and social development are supplemented by establishing a limit on number of workers and employees and an assignment for reducing the use of manual labor.

The following indicators of labor and social development are envisioned in the petroleum industry: labor productivity in petroleum extraction per working person; specific number of industrial production personnel and wages norm per operating well; total wages fund; assignment to reduce the use of manual labor; limit on number of workers and employees, specifically industrial production and nonindustrial personnel in drilling and geological prospecting; norms for the formation f material incentive funds and funds for sociocultural activities and housing construction according to deduction rates by the ton.

In the 11th Five-Year Plan material incentive to workers for achieving high indicators in labor paid from economic stimulation funds is also being improved. In the sector these funds will be formed on the basis of stable norms: deduction rates per ton established for the five years with differentiation by years, for stimulation of counter plans that exceed the assignments of the five-year plan for the next year — at increased per-ton rates (norms), and to stimulate economy of labor inputs — by norms depending on reduction of specific labor inputs to operate a well. This will promote achievement of optimal final results and growth in labor productivity.

The current phase of development of the national economy demands expansion and deepening of economic accountability methods and strengthening material accountability and interest in the achievement of final results. For this reason the role of indicators that define resource inputs is increasing in planning and evaluating the economically accountable activities of associations.

In the petroleum industry production costs, like labor inputs, are directly related to operation of oil wells. Expenditures to operate one well depend less on natural factors than expenditures to extract one ton of petroleum (where the primary factor is the productivity of the petroleum layer).

Based on concrete sectorial conditions of economic activity, provision is being made for the use of plan indicators in the section of finances and prime costs, in particular specific production costs to operate an oil well and the total sum of profit, including profit for the industry and for drilling work separately.

To strengthen the economic accountability influence toward reducing labor inputs provision is made for a significant increase in the rate of contributions for state social insurance, introduction of supplementary payments to salaries and wage rates (in amounts up to 30-50 percent) for wage fund savings (within the limit of one percent of the fund), and transfer of unused savings in the wages fund to the material incentive fund (within the limits of above-plan profit on the condition that the plan of production and growth in labor productivity was fulfilled).

Important economic steps are being taken to increase the interest of production associations in better use of productive capital and efficient use of natural resources. A payment for water consumed by petroleum extraction enterprises from water supply systems will be instituted as part of prime cost to achieve this goal.

New economic procedures will significantly increase the effect of the payment for productive capital on the amount of profit that remains at the disposal of production associations. Among these steps are increasing the normative payment to six percent, reducing the volume of productive capital on which no charge was (temporarily) collected, and paying for above-norm, non-credited stocks of material assets and uninstalled equipment. In this case, if the production association fulfills its plan for production and profit with less capital value than envisioned by plan, the savings from the payment for capital remains at the disposal of the association and payments to the budget are reduced by this amount. Considering that the norm for payment for productive capital in oil extraction is 11 percent of balance cost, this economic accountability lever will be very effective.

Another step that will stimulate the production association to get additional profit is leaving 50 percent of above-plan profit at the disposal of the enterprise (on the condition that the profit plan is overfulfilled by up to three percent).

The development of economic accountability is broadening opportunities for introducing technical progress. To accelerate scientific-technical progress, plans for 1980 envision completing the transition of scientific research organizations to an economically accountable system of work organization based on schedule orders that define performance of jobs in all stages from scientific research to introduction of results in production as well as the resources necessary for this. The creation of a single fund for the development of science and technology is envisioned in the sector to finance scientific research work and repay expenditures related to incorporation of new industrial processes and heightened expenditures during the first years of work.

This fund will be formed from deductions from the planned profit of associations according to a norm, established in the five-year plan with a breakdown by years, in the form of a rate per ton. In the same way (or as a percentage of commodity output) the five-year plans will stipulate the volume of expenditures for scientific research and experimental design work. At the same time incentive funds will be formed at scientific research organizations.

Internal economic accountability must also be strengthened. In particular, the economic accountability of the petroleum extraction shop and production brigade, based on brigade forms of organization and wages widely used in the petroleum industry, is becoming more and more important. This form of labor organization has a positive effect on the economic indicators of the shop and the enterprise and is expected to be the principal form in the 11th Five-Year plan.

The share of profit left at the disposal of the sector to finance capital investment, repay bank credit, insure growth in working capital, and form the single fund for the development of science and technology and the economic stimulation funds will be determined on the basis of the assignments of the five-year plan and long-term economic norms after preparatory work by the Ministry of the Petroleum Industry. The difficult feature of working out such norms for the petroleum industry is the need to consider the impact of worsening national conditions of exploitation at the deposits by years of the five-year period.

The forms of sectorial economic accountability are also being expanded further by material incentives for the work of the associations. Centralized economic stimulation funds are being formed at the ministries for this purpose.

The full range of measures to improve the economic mechanism requires a great deal of organizational work. It is important to explain the basic principles of the decree and the significance of improving management and planning, because this will provide a reliable lever to increase production efficiency. The party views it as a major economic and political challenge.

Preparatory steps are being taken in the petroleum industry to carry out the measures envisioned by this decree. Work is being completed on writing a coordinating plan of scientific research that includes a significant volume of research on improving the sectorial economic mechanism. During the fourth quarter of 1979 and the first quarter of 1980 specific organizations must work out a set of measures and recommendations that will insure the following.

1. An increase in the role of sectorial five-year plans, the level of their reliability, and their stability by making economic and engineering calculations for volumes of petroleum extraction based on petroleum reserves in the industrial categories and projections and industrial plans for the exploitation of petroleum deposits.

2. A rise in the level of planning for capital investment and material-technical resources that insures strict balance between them and production volume.

3. The introduction in planning practice of an automated system of planning calculations using progressive norms.

4. The development and performance of comprehensive programs to save metal and fuel and to automate and mechanize labor-intensive jobs and manual work.

5. The development of a system of economic stimuli directed to raising the efficiency of petroleum production and fuller use of petroleum and petroleum gas resources.

6. The strengthening and development of economic accountability methods of management.

To strengthen the normative base of planning and economic accountability the scientific research institutes of the sector are developing: a statute on the certification of the petroleum-gas extraction production association; a methodological statute on sectorial planning of the petroleum industry; methodological guidelines on determining the intensity of the plans of petroleum and gas extraction associations; a system of progressive technical-economic norms and norms of labor inputs, materials, and specific capital investments; a statute on the formation and use of the material incentive fund and the fund for sociocultural measures and housing construction in 1981-1985.

In addition, the sector is preparing to switch drafting and surveying work to five-year planning and is taking preparatory steps toward the development of a five-year financial plan with breakdown by years and production associations and broad development of brigade forms of labor organization and stimulation at the enterprises.

To do all this preparatory work on time requires a qualitatively new level of activity by the economic services and scientific research institutes of the sector.

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FUELS

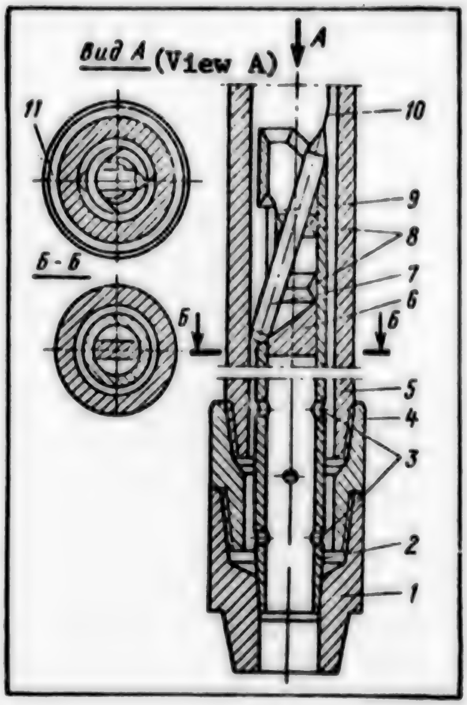
NEW OIL INDUSTRY EQUIPMENT DESCRIBED

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 12, Dec 79 pp 57-59

[Article: "News of the Petroleum Industry"]

[Text] Innovators at Komineft' [Komi ASSR Petrloeum-Gas Extraction Administration] have developed a device to orient the deflector in well shafts with zenith angles of less than five degrees where series-produced inclinometers with electromagnetic compasses are employed.

The device (see Figure) consists of a large-diameter diamagnetic pipe 5 which is connected with the deflector by means of steel lock 4 and steel adapter 1. Small-diameter diamagnetic pipe 2 is installed coaxially inside large-diameter pipe 5 and connected by the bottom part to steel adapter 1. The small-diameter pipe has circulation openings 3 and wedge 6, also made of diamagnetic materials, is set in the upper part of the pipe at least 3.5 meters from the steel elements. The diamagnetic centering shoes 8 guide the inclinometer into the notch in forming element 9.



During measurement inclinometer 7, suspended on electric cable 10 without an extender and stamp, slides on its lower end along guide wedge 6, moved by centering shoes 8 and goes into notch 9; at this time the inclinometer's plane of inclination coincides with the deflector's plane of action.

The device is assembled as follows. After adapter 1 is screwed onto the deflector or reinforced drilling pipe, marker 11 of the plane of action of the deflector is put on it. Then small-diameter diamagnetic pipe 2 with centering diamagnetic shoes 8 and diamagnetic inclined wedge 6 is screwed into adapter 1.

Pipes 2 are turned so that the plane passing through the axial line of notch 9 and inclined wedge 6 coincides with marker 11.

The device was successfully tested and introduced at the Pashninskoye and the Usinsk sites at depths down to 2,300 meters during the drilling of both slanted directional wells and orientation drilling for new shafts. As the results of this work demonstrated, error in determination of the azimuth of the deflector setting is ±5 degrees, and does not depend on depth. The number of chips in the deflector was reduced and economic and quality indexes improved.

Instructions have been developed by PechorNIPIneft' [Pechora Scientific Research and Planning Institute of the Petroleum Industry] on how to orient the deflector in vertical well shafts.

Technical Specifications

Possible error in determination of the azimuth of the deflector setting, degrees	5
Zenith angle of shaft at which given precision of measurement is guaranteed, degrees	5
Minimum well diameter in which device can work, millimeters	214
Outside diameter of housing, millimeters	170
Length, meters	8,000-12,000
Maximum possible length of inclinometer, meters	1,300
Types of inclinometers	IK-2, IT-200, I-7

The special planning and design office of the Soyuznefteavtomatika [USSR Petroleum Automation] Association has developed the SM-1 multichannel adder, which is included in the hardware of the automated system for control of industrial processes at petroleum extraction enterprises. The SM-1 adder is designed for algebraic adding, displaying, and outputting information received simultaneously along several measurement channels from external devices with pulsed output.

The principal characteristics of the adder are better reliability for simultaneously adding and subtracting input pulses, the possibility of varying the number of adding and subtracting channels in any ratio, and the use of series K155 integrated microcircuits as basic elements.

The figure below gives a schematic diagram of the SM-1. In terms of design the adder comes in panel or table models and consists of functional subblocks: pulse accumulater with digital display; algebraic adder; power supply.

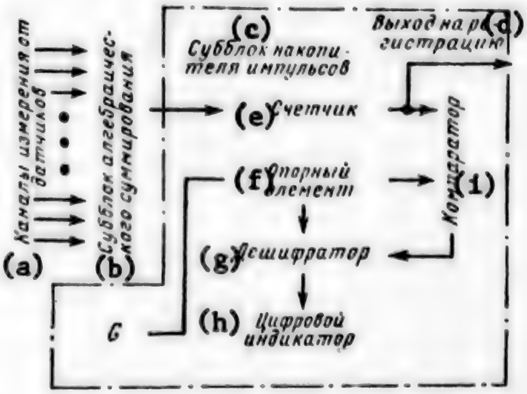


Figure. The SM-1 Multichannel Adder

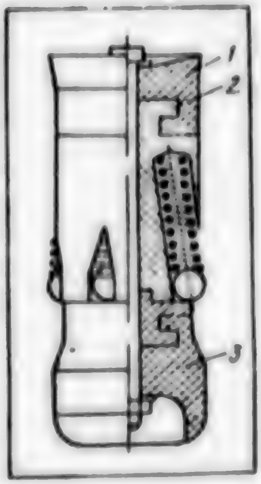
(a) Measurement Channels from Pickups;
(b) Algebraic Addition Subblock;
(c) Pulse Accumulater Subblock;
(d) Output to Recording
(e) Counter;
(f) Paired Element;
(g) Decoder;
(h) Digital Display;
(i) Comparator.

Technical Specifications

Number of channels	10
Capacity of counter, decimal places	6
Error of algebraic addition and pulse accumulation, pulses	±1
Parameters of input signals:	
Maximum frequency of incoming pulses, Hz.	100
Amplitude of DC Pulses, volts	±10-24

Length of communication line of measurement channel, meters	Up to 1,000
Resistance of communication line, ohms	No more than 10
Parameters of AC single-phase power supply:	
Voltage	222±10/15%
Frequency HZ	50
Power consumption, volt-amperes	27
Dimensions, millimeters	190 × 356 × 380
Calculated annual economic impact, rubles	2,500

Permneft' [Perm' Petroleum-Gas Extraction Administration] developed the GUPP-00 hydraulically installed rubber packer to seal the cross-section of the pump-compressor pipe (inside the pipe) when pipe is being lowered and raised under pressure.



The packer (see figure) consists of three basic parts: stabilizer 1, lock 2, and sealing element 3. The stabilizer maintains the coaxial alignment of the pipe and packer, which is necessary to increase the reliability of locking and sealing. The lock makes it possible to stop the device reliably at any point in the pipe. The sealing element reliably seals the inside of the pipe at pressures between 0 and 300 kilogram-force per square centimeter.

Two methods of installing the packer are suggested.

1. Installation by pressing down with a liquid through gaging tanks, with depth of setting controlled by the volume of fluid fed.

2. Installation by forcing down with air from a UKP-80 compressor and then measurement of setting depths using the AzINmash-8 device.

Pump-compressor pipe has been lowered and raised under pressure using the GUPP-00 packer together with a sealing head at the Kungur, Chernushka, and Polazna petroleum-gas extraction administrations.

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FUELS

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NEW PETROLEUM DISCOVERY AT UDMURTIYA

Moscow NEFTEGAZOVAYA GEOLOGIYA I GEOFIZIKA in Russian No 10, Oct 79 pp 15-16

[Article by V. P. Usupov (Izhevsk Drilling Administration of the "Udmurtneft" Association)]

[Text] The Mozhginskaya branch of the Kamsko-Kinel'skaya system of foredeeps passes through Udmurtiya from the southwest turning east in the central part. In the east, near the Shumovskiy ledge, this branch merges with the Sarapul'skaya branch of the Kamsko-Kinel'skaya system of foredeeps and changes over to the Shalymskiy foredeep. Along the edges of this branch of foredeeps are located chains of ledges of the Late Frasnian-Famennian-Tournaisian age: on one side -- the Vavozhoko-Syurovaysko-Krasnogorsko-Kiyengonskaya,and on the other side -- the Golyushurmino-Yagano-Izhevskaya chains. Recently, this branch of foredeeps attracted the attention of geologists in connection with the discovery of a number of petroleum deposits of various origins in various stages of Paleozoic sedimentations.

The discovery of exploration well 397 (Fig. 1) of a petroleum deposit at the Yakshur-Bod'inskiy upheaval in the Tournaisian terrigenous sedimentations should be considered of special interest. The Tournaisian sedimentations are represented here by interstratifications of limestone and dark gray argillites in the upper part and light gray, very thick sandstone in the lower part. The stratum of interstratified light gray and gray sandstone and dark gray argillites are segreated in the 1676-1756m interval. The petroleum saturated sandstone, presumably of the Malevskiy age in the 1676-1727m interval, lie under carbonaceous-terrigenic rocks characterized on the adjacent Yuzhno-Kiyengonskaya area as Malevsko-Upinskiye. Moreover, in well 277 on Yeseneyskaya area G. D. Kireyeva et al. (1972) found spores in clays over the roof of sandstone that confirm their confinement in the upper part of the Malevskiy level. The deposit itself is related to a small bioherm of the Frasnian-Femennian age which it surrounds. The height of the bioherm is 170 m and its size is 2.5 x 1.5 km. The structure amplitude along the second reflecting level is about 50 m.

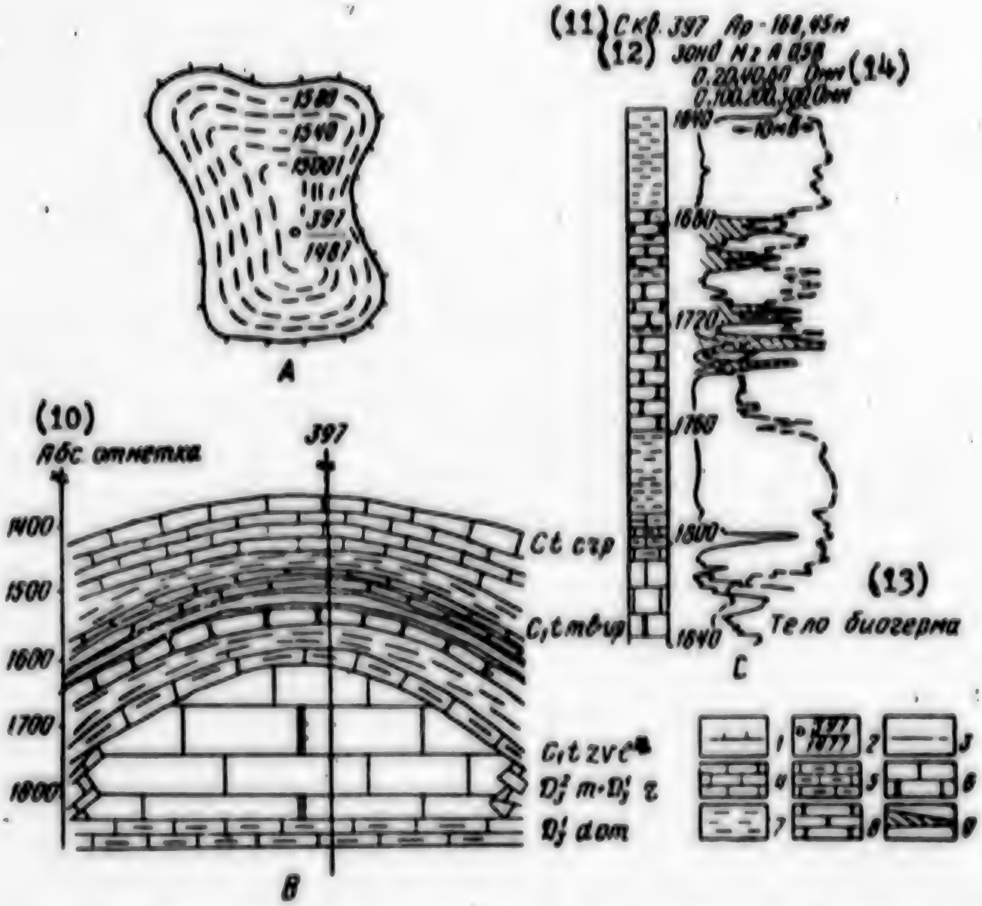

Fig. 1. Structural arrangement of the Yakshur-Bod'inskiy bioherm:

A. structural map along roof of the Malevskiy petroleum-saturated sandstone;
B. structural arrangement of the bioherm;
C. geological cross section and the geophysical characteristic of the carbonanceous-terrigenous rocks of the Tournaisian age enveloping the bioherm;
1. boundary of the bioherm body;
2. in the numerator -- well 397 in the denominator -- elevation of roof of sandstone;
3. isohypses of sandstone roof;
4. light, normally layered limestone;
5. argillaceous limestone;
6. light, massive nonlayered limestone and dolomite;
7. argillites;
8. sandstone;
9. petroleum saturated sandstone;
10. Absolute level;
11. Well 397;
12. Probe;
13. Body of the bioherm;
14. Ohm-meter.

When testing, a flow of petroleum with a density of 0.895 g/cm^3 was obtained.

Petroleum obtained for the first time in Udmurtiya from sandstone in the terrigenous rocks of the Tournasian stage is of very great importance. This sandstone was traced in wells of the Yeseneyskaya, Rozhninskaya, Aksenovtsevskaya and Lyukskaya areas. Some investigators relate the development of sandstone to the activity of muddy streams that moved fragmental material from the upper part of the accreation terrace slope to the deep water part of the Mozhginskaya branch of the Kamsko-Kinel'skaya foredeep system (M. M. Grachevskiy et al., 1976).

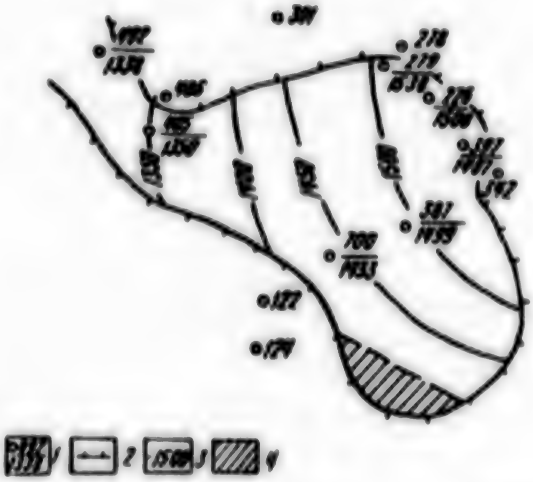

Fig. 2. Arrangement of Malevskiy sandstone distribution:

1. exploration wells; number of well in numerator, absolute level of roof sandstone in denominator;
2. boundary of sandstone taper;
3. isohypses of sandstone roof;
4. probable petroleum deposit

Not only structural deposits, but also lithological deposits in zones where it tapers out to the edges of the foredeep system are related to this sandstone. The southern and northwestern boundaries of the sandstone distribution are of special interest.

On the sandstone roof map (Fig. 2), the abolsute levels of the roof rise in the northwestern and southern directions. The tapering out of sandstone in these directions was not traced; therefore, it is necessary to obtain additional seismic profiles in these directions to detect the tapering out boundaries and then drill deep exploration wells.

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OB'-VOLGA PIPELINE TAKES ANOTHER STEP TOWARDS COMPLETION

Moscow PRAVDA in Russian 13 Jan 80 p 2

[Article by B. L'vov, correspondent of the press center of the Ministry of Construction of Petroleum and Gas Industry Enterprises: "From the Ob' to the Volga"]

> [Text] The oil of the northern Ob' region came another 200 kilometers closer to the center of the country. The builders, having laid an underground steel line from Surgut to Perm', in the first days of the new year opened up the road for the "black gold" to the Volga region. The trunk line that connects the two great Russian rivers, the Ob' and the Volga, is finding visible features.

The Siberian oil continues its advance towards the city of Gor'kiy on the middle arm of the giant transcontinental fuel and energy artery. Its extent has already surpassed 2,000 kilometers. The total length of the trunk line from Surgut to Polotsk will be over 3,300 kilometers.

Thus, the oil refiners of the Urals have become able to produce from the Siberian hydrocarbon raw material many thousands of tons of fuel, lubricants and other products. Now they are preparing to greet the oil at the plants of the Volga region. This is a new and important stage in the construction and assembly work of the subdivisions of the Ministry of Construction of Petroleum and Gas Industry Enterprises both in the regions of the Gor'kiy left bank, and on the segments of the route that intersect the Vladimirskaya, Yaroslvskaya, Kalininskay, Vitebskaya and a number of other oblasts.

Competing in honor of the 110th anniversary of V. I. Lenin's birth the collectives of the trusts "Mosgazprovodstroy," "Ryazan'truboprovodstroy," "Shchekingazstroy" and others are universally increasing the work rates. In short times the 1.5-kilometer pipeline bridge was laid on the bottom of the Volga, and now the diver-installers are faced with crossing the great river two more times in its headwaters. In the underwater work the subdivision of M. Shuranov has distinguished itself; they have a thousand hours of underwater work on their account. Construction of the pumping stations continues: there will be over 30 of them. Helicopter pads, communications lines, residential cities, roads and reservoir parks are being constructed. In order for the flow of transported oil to constantly rise the builders and assemblers are preparing new fields in the northern Tyumenskaya oblast for connection to the trunk line.

The day is coming ever closer when on the economic map of the country yet another large oil trunk line will appear that stretches over two continents, from Asian Surgut to European Polotsk. The national economy of the country will obtain tens of millions of tons of fuel and raw material.

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MACHINE SHORTAGE SLOWS SIBERIAN PIPELINE CONSTRUCTION

Moscow EKONOMICHESKAYA GAZETA in Russian No 4, Jan 80 p 4

[Article by Ye. Gromov, senior scientific colleague of the Scientific Research and Planning-Surveying Institute of Economics and Control Systems of the Ministry of Construction of Petroleum and Gas Industry Enterprises: "Under Conditions of the Siberian Winter"]

[Text] The Ministry of Construction of Petroleum and Gas Industry Enterprises is the primary general contractor for the development of the West Siberian oil and gas complex. Judging from everything, already in the near future the share of work in this region will exceed half of the general program of the ministry. This requires a growth in the facilities of the corresponding construction-assembly organizations of the Ministry of Construction of Petroleum and Gas Industry Enterprises.

We do not have to set our hopes on increasing the number. As is known, the labor resources are very limited. And it is not inexpensive for a person to stay under the harsh conditions of the Tyumen' north. Consequently, the stress should be placed on the active introduction of technical innovations that increase labor productivity.

Practice has shown that in the swampy regions of West Siberia the primary construction of main pipelines can be carried out only in frosts. Precisely in the winter period the main volumes of work should be done. Therefore for the builders of West Siberia it is exceptionally important to increase the deliveries of machines and mechanisms in northern design.

In the current year, for example, work remains on construction of a number of gas pipelines from Urengoy, and further development of the gas fields of Urengoy, Medvezh'ye, Vyngapur, Yamburg and the oil fields. Laying of a large number of field and interfield pipelines is required. In these regions the temperatures reach 50-55 degrees. At the same time the Ministry of Construction of Petroleum and Gas Industry Enterprises receives no more than a tenth of all equipment in the northern design.

A qualitative change in the working fleet of equipment by means of increasing their unit outputs acquires special urgency. Comprehensive mechanization of all links in the production process is necessary. This matter needs the active assistance of the machine builders. The example of equipping the BAM [Baykal-Amur Mainline] construction shows the effectiveness of such help.

The solution to this question is facilitated by the fact that the designers and experimental-pilot plants of the Ministry of Construction of Petroleum and Gas Industry Enterprises have developed a number of models of special equipment with regard for the construction experience in West Siberia. The majority of them have been tested in production conditions and are completely supplied with technical documentation sufficient for organization of output. The new mechanisms have been called upon in the first place to eliminate the revealed disproportions between the output of the individual links in the flow-line construction of the main pipelines.

The welding operations are the leading in the complex production line. On the average during the season one brigade welds up to 60-70 kilometers of pipes 1.420 millimeters in diameter. The brigade of USSR State Prize laureate B. Diduk reached an output up to 110 kilometers. However the collectives engaged in digging trenches and filling in the laid pipelines are sharply lagging behind the welders.

At the same time a rotary excavator ETR-254 with output up to 1,200 cubic meters per hour (on soils of the I-II categories), as well as the excavator EO-4221 installed on expanded rubber-metal caterpillar tracks have been made and successfully passed tests for making trenches. A special machine based on the same ETR-254 excavator has been also made to fill in the trenches. These models were demonstrated at the test site near Moscow. There the pipe-layers with lifting capacity of 50-60 tons (versus the currently manufactured ones with lifting capacity 35 tons) were also shown. Their use will make it possible to considerably reduce the number of machines in the complex line and to reduce the demand for skilled workers on the route. The units of contact welding "Sever" serve to sharply decrease the manual labor for welding operations.

But the equipment goes no farther than the test site. On the pipeline routes there are only single "Sever" machines. The Ministry of the Electrical Engineering Industry has not developed their production. It is the same situation with the units "Styk" designed to replace manual welding on the rotation angles.

According to the developed documents the Ministry of Heavy and Transport Machine Building starting already in 1980 could start to produce the ETR-254 excavators, trench fillers and other mechanisms. Could, but has not started.

The builders of West Siberia are also waiting for transportation equipment on an air pillow. They have been discussed for a long time, but as yet there is not even an experimental model capable of becoming the foundation for series production.

The machine builders in defining their boundaries for the 11th Five-Year Plan can and must take into consideration the needs of the Siberian workers for new, highly productive equipment adapted for work in severe conditions.

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REASONS FOR DONETSK GASOLINE SHORTAGES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 30 Jan 80 p 3

[Article by G. Ovcharenko: "Line at the Gas Pump"]

> [Text] "Like many Dontesk motorists I am disturbed by the question: when will our gasoline suffering end? I go to the gas pump once a week and in order to fill up I have to stand in line for 2 hours.
>
> Kokhanyy N. S."

This is one of the many letters that speaks of the "gas sufferings" in the Donetskaya oblast. Is it already such a critical situation? In fact has not a chronic gasoline "famine" occurred here?

"Roughly so," the head of the Donetsk freight-transport administration of the Ukrainian SSR Glavneftesnab [Main Administration for Transportation and Supply of Petroleum and Petroleum Products] D. Maksuyev agreed with a sigh. He showed me a report: on the day that this interview was held for the entire oblast there were 325 tons of gasoline of brand "A-76" and 580 tons of brand "AI-93." "The daily consumption," added Dmitriy Maksimovich "of 76 gasoline is 1,005 tons, and of 93--271 tons. If you add that there are ten-day periods when we do not receive a drop of fuel from the suppliers (and the filling points are beyond the limits of the republic) you should understand how the shortage is formed."

The documents confirmed the reasons listed by Maksuyev that sort of removed responsibility for the gasoline standstills from the Donetsk administration of the Ukrainian SSR Glavneftesnab.

But here I found a report that casts doubt on the statement of the administration head. In black and white it certified that deliveries of gasoline for the Donetskaya oblast in 1976 were made 100.1%, in 1977 100.8%, and in 1978 99.5 %. In 1979 the administration received more gasoline than planned. Therefore even arrhythmia in the supplies, if it exists, does not explain why there is not enough fuel for car owners. The more so since Maksuyev himself acknowledged that there is an instruction to supply motorists with gasoline right up to the brim of their cars' gasoline tanks.

It is a strange situation: judging from the report there is sufficient gasoline in the oblast, while there is none at the gas stations for the motorists (which I myself witnessed).

It is known that it is impossible to create something out of nothing. In the same way something, in particular gasoline, cannot be turned into nothing. Based on this axiom I held the next interview with the head of the Donetsk division of the Central Scientific Research Laboratory for Economic and Legal problems of Protecting Socialist Property of the USSR Ministry of Internal Affairs I. Shtan'ko.

"There is nothing supernatural in this phenomenon," Ivan Fedorovich stated authoritatively and convincingly proved this.

It turns out that the Donetsk oblast union of consumer societies instead of selling the fuel and lubricants in the rural locality transferred 60% of the gasoline intended for retail trade with the permission of its republic leadership to the association of automobile transportation. And where do the 48,000 car owners and over 120,000 motorcycle owners go for gasoline that live in the village? To the city of course. There, it is understandable, no one stores fuel especially for the village workers.

According to the extant statute only 20% of the state automobile transportation can fill up by coupons at the gas station. The remaining 80% must do so at the site of registration. But since it is burdensome to build their own filling stations, and there is no proper control over this, then not one organization in the oblast builds them. Therefore it is difficult for the motorist to get through to the filling station.

"There are your lines and there is your shortage," stated I. Shtan'ko. "And in addition, the very system for accounting for fuel and lubricants at the gas stations is favorable to every type of intrigue: the accounting is made in liters, and this volumetric unit of measurement in contrast to the weight units, kilogram, tons changes with temperature oscillations. The swindlers make use of this. One criminal group of workers of the gas station No 11 of the Donetsk bulk plant alone, by using these oscillations created surpluses of petroleum products and sold them "on the side" thus pocketing 8,000 R. The thieves received for their services, but the loopholes for such crimes remained. And although we went many times to the Ukrainian SSR Glavneftesnabsbyt [Main Administration for the Transportation, Supply and Marketing of Petroleum and Petroleum Products] so that the in-shift accounting of the fuels and lubricants at the filling stations would be made simultaneously in liters and kilograms, that is, in units of measurement that are mutually controlled, but the innovation was introduced only as an experiment at two stations. What a pity! As the calculations show, if our suggestion was introduced then for the Donetskaya oblast alone this would permit a saving from 700 to 1,000 T of gasoline per year.

It appears that the USSR Gossnab must examine this suggestion.

I also became interested in what is the real demand for gasoline for retail trade in the Donetskaya oblast.

Neither D. Maksuyev, nor the head of the department of transportation and communication of the Donetsk obkom of the Ukrainian Communist Party V. Markin, nor the deputy head of the oblast plan Ya. Korsunov could answer With great difficulty I finally was successful in finding out that the fund holder for gasoline for cars is the oblast administration of trade. It collects orders from the trade and transportation administration, sections of working supply of the enterprises, municipal trade organizations for trade of industrial goods, generalizes them and sends the information to the republic ministry of trade who then asks for the ordered tons of gasoline from the USSR Gossnab.

"How substantiated is your request" I ask the economist from the department of industrial goods of the oblast administration of trade V. Shchedrin.

"Usually we ask for 12-13% more gasoline than was allocated to us the previous year."

"And how did you determine the real demand for fuel the previous year?"

"Naturally from the requests coming to us from below," answered Shchedrin.

"But is their substantiation checked even once?"

Alas, they were not checked. And as it was found, no one in the oblast plan, or in the oblast administration of trade, or in the Donetsk administration of the Glavneftesnabsbyt in recent years has been interested in how many cars in personal use there are now in the oblast, what is their average annual mileage, and how much gasoline should be asked for in order for the motorist to be able to acquire it on any day at any gas station and without a many-hour line.

But perhaps this is difficult or even impossible to do?

With the help of I. Shtan'ko we solved this problem as well. It turned out that the car owners of the Donetskaya oblast consume roughly 74,000 tons of gasoline per year. This is without consideration for the 400,000 motorcycles. This means that the real demand is considerably higher.

And how much gasoline did the Donetskaya oblast administration of trade ask for, say, for 1980? Only 65,000 tons!

And finally: as we were told by the USSR Gossnab there are no restrictions on the sale of gasoline to the owners of personal cars. Only due to the poor management of certain economic workers in the localities, and the unsatisfactory work of the transporters do situations occur related to that which is observed in the Donetskaya oblast.

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DELAYS IN SURGUT GAS-PROCESSING PLANT CONSTRUCTION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 27 Jan 80 p 1

[Article by G. Kiksman: "'Necessary' Construction"]

> [Text] In the correspondence "They Are Not Hurrying to Finish..." published in SOTSIALISTICHESKAYA INDUSTRIYA on 2 October 1979 the unsatisfactory course of the building of the Surgut gas processing plant was discussed. At the same time the construction is one of the especially important ones: the plant has been called upon to supply the Surgut GRES continually with fuel.
>
> How did the general contracting trust "Zapsibenergostroy" and the USSR Ministry of Power and Electrification to which the trust is subordinate react to the criticism? They were silent. But, perhaps, the leaders decided that in the final analysis it is important to respond with action and not a letter?

No, nothing has changed in Surgut. If one believes the graphs I should become the witness of a vigorous finish: the putting into operation of the first phase of the plant was planned for December. But in January the picture of the construction site looked more like a slow start. The impression is as if the main and auxiliary productions had not started construction here 3 years ago, but just recently: around there are unfinished boxes of frameworks, tens of incomplete foundations under equipment, and somewhere the zero cycles have not yet been completed. At the facilities of the second phase there is complete calm: even the posts have not all been driven in.

In short, the fourth quarter of last year did not make any basic changes in the situation. Like the assignments of the 2 previous years the 1979 plan was barely fulfilled by half. The result is sad: during the entire time that the plant has been under construction, of the R 54 million the builders and assemblers have not even assimilated 20.

Now the USSR Ministry of the Petroleum Industry and the Ministry of Power and Electrification have agreed on new periods of completion: it is planned to put the first phase of the plant into operation in the second quarter, and the entire plant completely--at the end of this year. There is a large volume of work to be done, however, in January the builders continue to advance as slowly as ever.

It would seem that somebody like the power engineers should accelerate with all forces the start-up of the gas processing plant: for the output of the Surgut GRES will rise, as they say not in days but in hours! And the general contractor at both construction sites is the same, "Zapsibenergostroy." But how strikingly dissimilar these construction sites are! At the GRES facilities there is ideal order, a strict rhythm, a precise schedule. At the gas processing site, neither order nor work.

"And what do you want?" notes the director of the enterprise under construction F. Shakirov. "Our personnel 'famine' is a constant one. There should be over a thousand builders and assemblers at the construction site but there are not even 500."

"Soon there will not even be that many," irritatedly the brigade foreman of the mechanical assemblers from Orenburg V. Vlasov threw in. "We are thinking of leaving. There is nothing for us to do here. They planned for work in three shifts, but there is not even one complete shift. In winter it gets dark early and there are no lights at the site."

Their colleagues from "Dvigatel'montazh" back in December were summoned here by telegrams "due to the opening of a front of work in the compressor stations. Brigades flew in from Omsk, from Kuybyshev and Salavat--not close neighbors. And in time they go back: of the five only two compressor stations are poorly prepared for assembly.

A trifle, an organizational miscalculation? No. In this fact there is an attitude towards the facility on the part of the general contractor. For in many other cases its attention to this construction site has a purely paper nature. I recall the conversation with A. Khabarov, head of the PMK [advance mechanized column] "Zapsibenergostroy" that is building the gas processing plant. By his words almost everything is a mess--due to the poor work of the planners. They foil the schedules for presenting documents, make too many corrections in them, and this disorganizes the construction. We notice that it disorganizes so that the altered drawings of the trestlework of the materials lines have been lying in the builders' archives almost all of last year, from January to late fall. For the mechanical assemblers this "forgetfullness" costs a thousand man-days and R 20,000 of additional wages.

We will transport ourselves in an instant to the environs of Nizhnevartovsk where recently the assembly of the Belozernyy gas processing plant was completed in record time; it is equal to the Surgut plant in output. What helped to accelerate the business there? Normal organization of labor, normal general conditions, and a good production base. Simply speaking, there they had studied the peculiarities of the Siberian climate and begun precisely from the base. They built the production framework for enlarged assembly of equipment and erected dormitories for the people.

And in Surgut? Here the assembly industrial base will be finished after the plant is put into operation. At least at the present day less than half of the R 3.5 million allocated for it have been assimilated. Thus, an assault has already been programmed for this spring; for the labor intensity of the assembly under field conditions is rising 3-4-fold. And this means that the subdivisions of the USSR Ministry of Installation and Special Construction Work will be whipped with the next wave of missions. And where will the people be placed?

The head of the Surgut administration "Zapsibneftekhimmontazh" V. Sidel'nikov reported that in last year alone the collective lost over 100 assemblers, almost half of the staff. The people were let go mainly due to the unsatisfactoriness of the dwellings. That is there are not enough dwellings for the permanent contingent of assemblers, not to mention those sent on business!

At the same time, no further than in September the first deputy minister of power and electrification of the USSR P. Falaleyev placed his signature on a document which is not the first in count that, in particular, states: " "Guarantee the placement of workers sent on business to the organizations of the USSR Ministry of Installation and Special Construction Work, in well-organized dormitories." But this placement has only been partially fulfilled. The resources, and they are great, that are annually allocated for the residential construction of the oil worker, power engineering work and assembler the Surgut house-building kombinat of the Ministry of Construction of Petroleum and Gas Industry Enterprises is assimilating at truly tortoise rates. And "Zapsibenergostroy" who in the given case does not formally anwser for the erection of residences, essentially also withdraws from concern for the complex carrying out of the work. For the general contractor does not even hurry to bring the city made of temporary trailers into order: to repair, heat and install water lines needs neither great resources nor special forces. There is just not enough concern.

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FUELS

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STUDY OF THE SAMOTLOR DEPOSIT

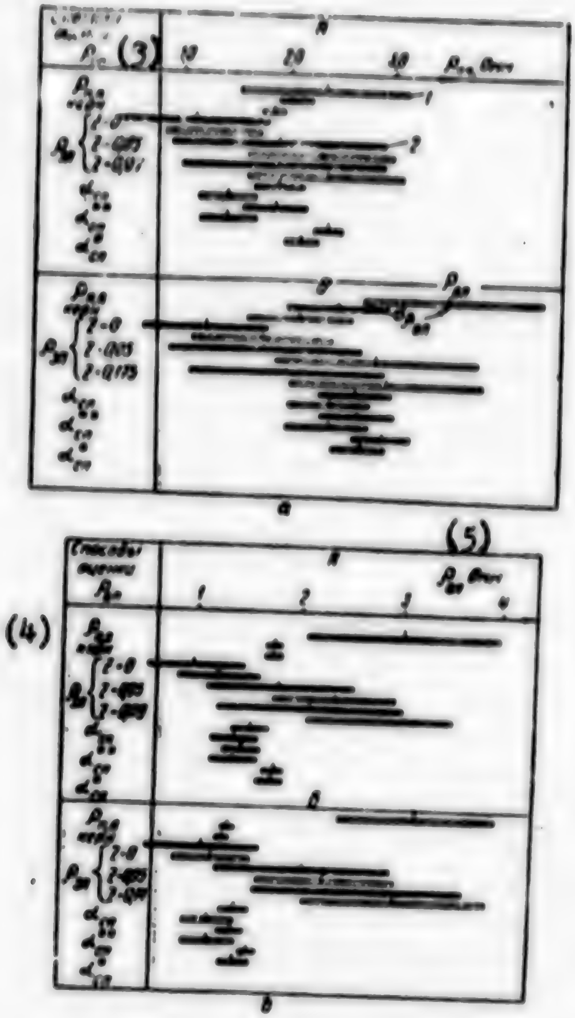
Moscow NEFTEGAZOVAYA GEOLOGIYA I GEOFIZIKA in Russian No 10, Oct 79
pp 29-32

[Article by T. F. Dyakonova (Moscow Order of Labor Red Banner Institute of Petroleum Chemical and Gas Industry imeni I. M. Gubkin): "Determination of Specific Electrical Resistance of the Water Saturated Stratum of the Samotlor Deposit"]

[Text] In evaluating the petroleum saturation coefficient by means of saturation parameter P_n, it is necessary to know the specific resistance $\rho_{вп}$ of fully water saturated strata, which is determined by the porosity coefficient or by direct correlation with geophysical methods indications. Incorrect evaluations of the $\rho_{вп}$ may lead to large systematic errors in calculating petroleum reserves. Calculated values may be compared directly with specific resistances $\rho_{п.в}$ of water-bearing strata lying beyond the boundaries of the water-petroleum contact zone. To carry out a fuller analysis, it is also desirable to calculate the value of the $\rho_{вп}$ in the water-bearing part of the profile by the same methods as in the productive strata. In this case, in making the analysis, the $\rho_{вп}$ data should be represented not in the shape of singular determinations, but in the shape of statistical distributions of the entire data file evaluating their characteristics by deposits, which makes possible a judgment about the presence of systematic deviations in the bulk of the determinations.

An analysis of the specific resistance of fully water-saturated rocks when using various methods for evaluating the $\rho_{вп}$ was made of Samotlor deposits. The selected strata included productive and water-bearing layers along AV_{1-5} and BV_{8-10} levels. The values of $\rho_{вп}$ were evaluated by the porosity coefficient found by the core sample; by the resistance of the penetration zone with various values of shift factor z; by the average amplitude of self-polarization potentials with and without introducing corrections for the thickness and petroleum saturation of the strata. The results of the statistical processing of the determinations of the $\rho_{вп}$ (average values of $\bar{x}$, root-mean-square devaitions σ_x , variation coefficients ν_x , the efficiency of separating the layers of into productive and water-bearing) are shown in Fig. a, b.

As shown on the Fig., the average values of $\rho_{\text{вп}}$ for productive and water-bearing strata, determined by various methods, differ from each other considerably and from the specific resistance $\rho_{\text{п.в}}$ of water-bearing for the peripheral wells.



Comparison of values of $\rho_{\text{вп}}$ determined by direct and indirect methods for the Samotlor deposit:

a. levels AV_{1-5};
b. levels BV_{8-10};
1. water;
2. petroleum

A. pure
B. argillaceous
3. method of evaluation
4. core
5. Ohm-meter

The deviation of $\rho_{\text{вп}}$ values, determined by one method for collectors with various saturation, may be due either to insufficient efficiency of the correction introduced into the parameters, or to the difference in collector properties of the petroleum-bearing and water-bearing parts of the stratum. The system of correction coefficients used in methods for evaluating the porosity (for example, $P_{\text{он}}$, z, resistance corrections in evaluating $k_{\text{п}}$ by the self-polarization method, etc.), must remove the effect of the nature of the saturation on specific resistance $\rho_{\text{вп}}$ of the fully water-saturated rock. This process may be monitored by plotting integral distributions of $\rho_{\text{вп}}$ values according to strata with various types of saturation.

A full superimposition of distributions one upon the other, when the efficiency of the division of the strata is near 50%, indicates that the effect of saturation was removed and that the corrections were selected properly. The distribution of $\rho_{\text{вп}}$ according to petroleum bearing ($\rho_{\text{вп,н}}$) and water-bearing ($\rho_{\text{вп,в}}$) strata diverge greatly. Only for pure and argillaceous collectors of level BV is the efficiency near 50%, when evaluating $\rho_{\text{вп}}$ by the resistance of the penetration zone. The deviation of efficiency from 50% indicates that either the corrections introduced for saturation are too small, or that the volumetric and filtration properties of the productive part of the deposit and of the water-bearing collector are different. This is related to the processes of secondary transformations, which cease or are retarded with the arrival of petroleum into the rocks, while in the water-bearing part these processes continue and lead to the deterioration of the collector properties [6]. This is confirmed by the results of analyzing the core probe selected from the petroleum- and water-bearing parts of the deposit (Table). Therefore, the values of $\rho_{\text{вм}}$ must comply with the relationship of type $\rho_{\text{вп,н}} < \rho_{\text{вп,в}}$, which is fulfilled only when $\rho_{\text{вп}}$ is evaluated by the porosity coefficient according to the resistance of the penetration zone. This relationship does not hold for other methods.

The reasons for the divergence between values of direct determinations of resistance according to water-bearing strata $\rho_{\text{п.в}}$ and the indirect determinations of $\rho_{\text{вп}}$ according to core samples ($\rho_{\text{вп}}^{\text{керн}}$), or according to geophysical data ($\rho_{\text{вп}}^{\text{геоф}}$) are: effect on $\rho_{\text{п.в}}$ of the residual petroleum saturation and the deep zone of penetration of the fresh water filtrate of the drilling mixture; the effect on the $\rho_{\text{вп}}^{\text{керн}}$ of the poor core sample with the preferential selection of samples from the worst collector; the low quality of the initial geophysical material.

The values of specific resistances for perimeter strata ($\rho_{\text{п,в}}$) were analyzed to evaluate the effect of various distortions.

Table

(1) Горизонт	(2) $K_п$ по нефтеносным образцам	(3) по водоносным образцам	(5) $_{вп}^{расч}$ (4) по $K_п$ нефтеносные образцы	(6) водоносные образцы
(7) АВ$^1_1$	0,22	0,19	3	4
АВ$^2_1$	0,26	0,23	2,1	2,9
АВ$_3$	0,26	0,24	2,1	2,4
АВ$_{4-5}$	0,28	0,27	1,8	1,85
(8) БВ$^1_8$	0,24	0,22	1,8	2,3
БВ$^2_8$	0,25	0,24	1,75	1,8

1. Level	4. according
2. according to petroleum-bearing samples	5. petroleum-bearing samples
3. according to water-bearing samples	6. water-bearing samples

The specific resistance of water-bearing strata was determined according to BEZ [expansion unknown] ; according to the diagram of a single probe AO = 4.25m, of the induction method ($\rho_э$). An analysis indicated that values $\rho_п$ BEZ and $\rho_к$ 4.25 have no systematic shifts, while the induction method gives somewhat higher values of $\rho_э$ as compared to $\rho_п$ BEZ which is probably related, to the imperfection in the calibration of this method, the instability of the zero line in the recording process and partial effect of the penetration zone. On this basis, all values of $\rho_э$ were eliminated from the data for the water-bearing strata and the average values of $\bar{\rho}_{п,в}$ were calculated for the deposits. They decreased by about 2.5%.

The residual petroleum in water-bearing strata, the presence of which is indicated by the data of the core sample taken from the water-bearing strata, may cause an overestimating effect on the $\rho_{п,в}$. The number of such interstratifications is not great: 12 in the interval of level AV$_{1-5}$ and 24 in the interval of level BV$_{8-10}$. A calculation of the excess in the depth of occurence of these interstratifications above the level of the water-petroleum contact indicated that, for level AV, all strata with residual petroleum lie in the zone of the water-petroleum contact [VNK] , while in level BV, a part of the interstratifications with residual petroleum lie beyond the VNK zone. This difference for the Samotlor deposit is about ±12 to 15m. Thus, the higher value of $\rho_{п,в}$ in level AV is not related to the presence of residual petroleum. The value of k_{OH} in strata lying below the water table varies between 9.9 to 24.6% which corresponds to petroleum saturation parameter $P_{OH} = 1.16$ to 1.6. Calculations of specific resistance made for these interstratifications with and without taking k_{OH} into account indicated that the value of $\rho_{п,в}$ may be higher by about 20% due to the presence of residual petroleum in the perimeter part of the profile.

The overestimating effect on the $\rho_{п,в}$ may also be produced by the deep penetration of fresh filtrate of the drilling solution into the stratum. However, the results of interpretation of BEZ data indicated that the penetration depths do not exceed eight diameters of the well and their effect on $\rho_{п,в}$ or $\rho_{к}^{4.25}$ can be neglected.

Thus, the values of specific resistances of water-bearing strata may be overestimated by 22% due to improper measurements by the induction probe and the presence of residual petroleum. Correction of the $\rho_{п,в}$ values led to some reduction in average values of $\bar{\rho}_{п,в}$ for individual types of collectors which reduced the overal spread between the values of direct determinations of resistances $\rho_{п,в}$ and the calculated values of $\rho_{вп}$.

To compare the values of $\rho_{вп}$, calculated according to the core sample, with geophysical values, it is necessary to establish that the core sample is really representative and reduce the values of porosity, obtained at atmospheric conditions, to the strata conditions of the deposit.

For a productive profile of the Samotlor deposit, the representation of the investigated core sample according to parameter p/n (number of samples per one meter of thickness) is on the average nine samples for a core sample loss of 40%. Considering the low loss of the core sample, smaller average values of the water-saturated rocks according to the core sample compared $\rho_{п,в}$ values of water-bearing strata, corrected by taking into account all distorting factors and the smaller range of changing the $\rho_{вп}^{керн}$ for argillaceous collectors compared to the range of changing the $\rho_{п,в}$, the conclusion can be drawn that the best rock samples were selected for laboratory analysis. Therefore, for argillaceous collectors, determination by the core sample cannot be considered representative, while for a group of homogeneous sandy collectors, they are adequately representative.

Resistance values of water-saturated rocks, calculated by the core sample ($\rho_{вп}^{керн}$), are underestimated by about 20% when strata conditions are not taken into account when the porosity coefficient is being determined.

An analysis of values $\rho_{п,в}$ and $\rho_{вп}^{керн}$ made it possible to take into account the individual reasons for the divergence between direct and indirect determinations of the resistance of water-saturated rocks, especially for a group of pure collectors. The divergence remains considerable for argillaceous collectors. This is due, in the opinion of the author, to the fact that determinations by core sample is non-representative for strata with deteriorated collector properties. Therefore, the calculated values of $\rho_{вп}^{керн}$ for this group of collectors cannot be relied on.

In analyzing the values of $\rho_{вп}$ calculated by the resistance of the penetration zone, it is necessary to establish the possibility of evaluating the porosity coefficient under conditions of the Samotlor deposit and the effect on the value of $\rho_{вп}$ of corrections for the residual petroleum and water saturation.

For the collector types studied, the penetration zone depth of level AV is, on the average, six diameters of the well and for level BV -- eight diameters with comparatively low values of $\rho_{зп}$: from 15 to 20 ohm-meter in argillaceous strata to 40-50 ohm-meter in pure strata which, in the author's opinion, makes it possible to evaluate the porosity and calculate $\rho_{вп}$ by the resistance of the penetration zone.

The role of corrections for residual petroleum and water saturation in calculating $\rho_{вп}$ by the resistance of the penetration zone is considerable. The introduction usually recommended for corrections only for the residual petroleum saturation (z = o) only give sharply underestimated values of $\rho_{вп}$ compared to the remaining methods.

For correction values z and P_{OH}, used in this paper for calculating $\rho_{вп}$ by the resistance of the penetration zone, physically substantiated relationships between the porosity of the productive and water-bearing collectors, as well as pure and argillaceous collectors, are complied with.

In calculating and analyzing the values of $\rho_{вп}$ by the method self-polarization potentials, the possibility of using this method to evaluate the porosity of the collectors of the Samotlor deposit was considered [2]. However, the dependence of the relative amplitude of self-polarization on the porosity coefficient $\alpha_{сп}=f(K_п)$ is very weak: the correlation coefficient for level AV is 0.61 and for level BV -- 0.64. Moreover, calculated $\rho_{вп,н}$ for petroleum-bearing strata exceed $\rho_{вп,в}$ in water-bearing interstratifications which contradicts the generally accepted concepts on improving the filtration and capacity properties of the collectors compared to the perimeter part of the deposit. Therefore, existing methods for removing the effect of petroleum saturation by introducing corrections to the self-polarization amplitude is not effective enough, because even after the introduction of corrections, relationship $\bar{\alpha}_{\text{сп,н}} < \bar{\alpha}_{\text{сп,з}}$. is preserved.

Thus, the analysis made indicates large systematic shifts in the values of obtained by direct and indirect methods. The most authentic for the Samotlor deposit are values of obtained by the resistance of the penetration zone A similar conclusion was obtained by a statistical analysis of geophysical data for this deposit [1].

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UDC 388.5:[622.276+665.6]

BOOK ON PRICE FORMATION IN PETROLEUM INDUSTRY REVIEWED

Moscow NEFTYANOYE KHOZYAYSTVO in Russian No 12, Dec 79 pp 69-70

[Review of the book "Tseny v Neftyanoy Promyshlennosti" (Prices in the Petroleum Industry) by V. K. Vasil'yeva, N. N. Kosinov, and S. M. Levin, Izdatel'stvo Nedra, Moscow, 1978: "Questions of Price Formation in the Petroleum Industry"]

[Text] The monograph under review is devoted to timely problems whose solution is extremely important for improving the mechanism of reproduction.

The first chapter considers methodological questions of planned price formation and general and specific features of solving them in the petroleum industry. The authors, in our view, correctly define socially necessary labor inputs according to the worst natural conditions of production. This logically leads them to recognize the existence of the objective conditions for the existence of differential rent in the petroleum industry.

The second chapter cites the characteristics of formation of production costs. Here a more exact delineation is needed of the impact on prime cost exerted by, on the one hand, factors that do and do not depend on enterprise activities and, on the other hand, natural and social factors. Moreover, it is essential to solve the problems of insuring full depreciation of capital before fields are depleted and to insure stable profitability for normally operating enterprises through the entire period of exploitation of deposits regardless of changes in the capital-output ratio at different stages of their exploitation.

While noting the advantages of the straight-line calendar depreciation computation method now in use, the authors point out that this leads to a significant increase in the prime cost of a ton of petroleum as deposits are exhausted. Therefore, they suggest progressively diminishing norms, a technique that has been tested in practice during computation of the payment for production capital.

One can agree with this proposal on the condition that the repayment period for the cost of wells under this method must coincide with their actual working life.

The third chapter of the monograph is devoted to the important, but not yet fully resolved problem of expressing the costs of geological surveying in wholesale prices. In our opinion, a correct acknowledgement of gological exploration work by the physical production sector demands a better grounded argument than is given in the monograph.

The problem of compensation for geological exploration costs in the prime cost of extraction through the price of minerals is considered thoroughly. Like any price, the price of minerals should perform accounting, redistribution, and stimulating functions.

We join in the conclusion reached at the end of the chapter, that questions of the price of a unit of explored mineral reserves and economic assessment of land and natural resources cannot be fully considered without a correct solution to the problem of differential mining rent.

The fourth chapter is, in our opinion, the most interesting and important one. It touches on the problems of the formation and movement of differential income and its conversion to mining rent. Because recognition or rejection of the category of differential mining rent and its material foundation (social value) is the central point in solving the problems of price formation, reproduction, and economic accountability, we will consider this chapter in more detail.

The authors are correct, in our view, to support the economists who take the production costs of enterprises operating in the worst natural conditions as the basis for cost and price. They recognize the existence of differential mining rent and its basis, social cost, as well as the existence of local ONZT [expansion unknown] and zonal cost and price.

However, it is somewhat odd to consider differential income as a form of differential rent, but not vice versa. In this case one may consider that profit shows itself in the form of income. In reality this is a concession to the economists who reject differential mining rent. In our opinion, the differential income that comes with exploitation of the best deposits becomes rent only in connection with the rule of transferring social costs to the socialist state. And rent is not just a category of production and exchange, as the authors write, but also a category of production and distribution.

Next the authors call attention to the differences between mining rent in the petroleum extraction industry and differential rent in agriculture, related to the fact that minerals cannot be reproduced, unlike soil fertility. This limits the amount of mining rent in magnitude and in time. Another characteristic occurs when petroleum extraction is intensified. Exaggeration of its significance led to the incorrect, in our view, statement of Ye. Kantor that there is no differential rent in the petroleum extraction sector.*

The authors correctly criticized, for inconsistency, the idea of so-called "polar rent" and acknowledgement of the need to have unprofitable enterprises and a system of state subsidies.

In the second section of chapter four the authors review the factors and indexes that make it possible, in conditions of the petroleum industry, to classify and divide the various forms of differential income by place and time of occurrence, and they are correct, considering that differential income should accumulate entirely at the place of its origin, that is, be expressed in prices for petroleum. The problem of determining differential rent II as the difference between the individual and social costs of additional petroleum extracted is correctly solved. However, we should stipulate that this type of income, rent as the authors call it, is a social value and should be distinguished from income received for the introduction of efficiency proposals.

One can agree with the opinion of the authors that part of differential income II should be left at the disposal of the enterprises only on the condition that it will be evaluated as additional aid by society to the collective of the enterprise, because the problem of material stimulation is solved on the basis of profit and income from the introduction of efficiency proposals; enterprises receive this profit and income for additional investment in means of production and labor.

The third section considers rent payments in the system of enterprise wholesale prices. The authors' approach, an attempt to create equal conditions of production activity for enterprises, is, in our opinion, new in theory and valuable for practice.

The last two chapters of the monograph are devoted to retrospective analysis of the development of price formation in the sector. In them, following the principle of combining the historical and logical elements of the investigation, the authors show how, as productive forces and economic science have developed, price-formation policy has more and more adequately reflected the objectively occurring process of formation of ONZT in the petroleum industry.

It has been established that, both theoretically and practically, the most suitable principle of price formation is based on zonal differentiation of prices with a system of rent payments within the zones.

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* "Tsenoobrazovaniye, Teoriya i Metodologiya (Materialy Konferentsii)" [Price Formation, Theory and Methodology (Conference Materials)], Leningrad State University, 1974.

It is important here to avoid mechanical implementation of the principle in practice.

In general, the monograph under review is extremely interesting and makes a worthy contribution to development of the problems related to optimization of the action of the economic mechanism in the petroleum industry.

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